

Amendment
Serial No. 10/825,816

IN THE CLAIMS:

1. (Currently amended) A gain-clamped semiconductor optical amplifier comprising:
a gain waveguide for amplifying an optical signal input to the gain waveguide; and
a grating layer having first and second gratings, the first grating disposed at a first end portion of the grating layer, and the second grating disposed at a second end portion of the grating layer,

wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating and the first and second gratings have reflection factors different from each other, and the gain waveguide includes mode conversion regions formed at both sides of the gain waveguide, the mode conversion regions having a width which becomes narrower or wider as it goes to a corresponding end of the semiconductor optical amplifier.

2. (Canceled)

3. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, further comprising a clad laminated on the gain waveguide.

4. (Canceled)

5. (Previously presented) A gain-clamped semiconductor optical amplifier comprising:
a gain waveguide for amplifying an optical signal input to the gain waveguide; and
a grating layer having a first grating disposed at first end portion of the grating layer,

Amendment
Serial No. 10/825,816

wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating and the gain waveguide includes a mode conversion region formed at one end portion of the gain waveguide, the mode conversion region having a width which becomes narrower or wider as it goes to an end adjacent to the semiconductor optical amplifier.

6. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 5, wherein the mode conversion region is not in contact with the first grating.

7. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 5, wherein the mode conversion region is in contact with a portion of the first grating.

8. (Cancelled).

9. (Currently amended) The gain-clamped semiconductor optical amplifier as claimed in claim [[8]] 1, wherein the mode conversion regions are not in contact with the first and the second gratings.

10. (Currently amended) The gain-clamped semiconductor optical amplifier as claimed in claim [[8]] 1, wherein each of the mode conversion regions are in contact with a portion of a grating adjacent to the mode conversion region.

11. (Currently amended) A gain-clamped semiconductor optical amplifier comprising:
a gain waveguide for amplifying an optical signal input to the gain waveguide;

Amendment
Serial No. 10/825,816

a grating layer having a first grating disposed at a first end portion of the grating layer;
and

non-reflection layers disposed on two portions of the semiconductor optical amplifier,

wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating, and the gain waveguide includes mode conversion regions formed at both sides of the gain waveguide, the mode conversion regions having a width which becomes narrower or wider as it goes to a corresponding end of the semiconductor optical amplifier.

12. (Canceled)

13. (Original) A gain-clamped semiconductor optical amplifier comprising:

a gain waveguide for amplifying an optical signal input to the gain waveguide;

a grating layer having a first grating disposed at a first end portion of the grating layer;

a non-reflection layer disposed on a first end surface of the semiconductor optical amplifier, the first end surface serving as an input/output side of the semiconductor optical amplifier; and

a high reflection layer disposed on a second end surface of the semiconductor optical amplifier,

wherein the gain waveguide is disposed on the grating layer in a direct contact with the first grating.

14-17. (Canceled)